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PATENT SPECIFICATION



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COMPLETE SPECIFICATION.

**Improvements in or relating to Bone Cutting or Crushing
Machines.**

I, ANTON GJELSTAD, a Norwegian Subject, of Granheim, near Sandefjord, Norway, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to bone cutting or crushing machines, especially those which may be used for cutting or crushing large bones, especially whale bones. The cookers now used necessitate the cutting up of the colossal whale bones by sawing. This is a lengthy and expensive operation.

The object of the present invention is to provide a bone cutting or crushing machine which may handle comparatively large bones, and rapidly break them up and crush them so as to make them fit for extracting the oil content thereof. This is obtained mainly by giving the bone cutter a shape and movement according to the principle embodied in rock crushing machines, but of course with the arrangement of teeth and other crushing means, suitable for the material in question.

According to the invention a bone cutting or crushing machine especially adapted for cutting large bones (whale bones), having a pair of jaws, which plate-shaped, downwardly converging jaws are provided with teeth or rows of teeth, is characterised in that one of these jaws is adapted to receive an up and down motion and simultaneously an oscillating motion at its lower part, while the other jaw is stationary, both jaws being provided with horizontal rows of teeth, preferably pointing downwardly, so as to cut the bones moved downwardly between said jaws successively in small pieces adapted for further disintegration by a rotary cutter or other crushing device.

An executional form of the present invention is illustrated in the accompanying drawings, in which:—

Figure 1 is a diagrammatic cross section of the bone cutter, and

Figure 2 is a corresponding longitudinal section.

The bone cutter, which is enclosed in [Price 1/-]

a strong casing 1 of iron or any other suitable material, comprises a stationary jaw 2 and a movable jaw 3 and a rotating cutter 4 co-operating with a row of teeth 5. At the bottom of the casing is arranged a screw conveyor 6, serving to transport the disintegrated bones to the cooking vats.

The moveable jaw 3 is hinged at its upper end to a stationary part of the crushing apparatus by means of a link 7. This jaw is driven from a motor which through the intermediary of an eccentric shaft 8 imparts to the jaw an up and down motion, and simultaneously an oscillating motion to the lower part of the jaw as indicated by the dot and dash circle, and in the direction indicated by the arrow 9. Both jaws are provided with teeth. As illustrated, these may be arranged in the form of broad horizontal rows of teeth with their points directed downwardly.

When the bones in an undivided condition or only divided into comparatively large pieces are fed into the space between the jaws, the upper rows of teeth of the moveable jaw will continually push the bones downwardly with short jabs. The number of revolutions are preferably about 100 per minute. The downwardly pointing teeth of the stationary jaw prevent the bones from being lifted upwardly.

As the bones pass downwardly they will be handled with constantly increasing force by the teeth of the moveable jaw. The lower teeth will be pressed into the bones, digging downwardly and then outwardly and tearing out pieces, which then fall down on the row of teeth 5, where they are cut up into small pieces by the rotating cutter 4.

As shown in Figure 2 the rotating cutter device 4 consists of a row of cutters placed side by side on a common shaft. These cutters work in the interstices between the teeth of the tooth row 5. The knives of the individual cutters are arranged in such manner that the cutter teeth form a helical line for the purpose of preventing all teeth from acting simultaneously, as would be the case if they

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were arranged in line with each other, and which latter arrangement would necessitate the use of an abnormally strong source of power. In Figure 1 the mutual axial position of the cutter teeth is illustrated by 10. The stationary jaw 2 is adjustable by means of a piece 11.

The conveyor screw 6 is encased in a trough, which next to the crusher is perforated and provided with an outer tube 12 for catching the oil, which runs off from the bones during the crushing operation. From here the oil may be removed in a known manner. The rows of teeth or teeth of the jaws, which are illustrated in the drawings as made in one integral piece, are preferably arranged detachably in order that, if the lower teeth are worn out sooner than the upper ones because of the greater stress to which they are subjected, one may replace the lower teeth by the upper ones or insert new teeth. As it will easily happen that muscles and tendons will wrap themselves about the cutter 4, its shaft is arranged hollow and provided with perforations at various points of the cutter, in order that one may be able to loosen such layers and rinse the cutter by letting water- or steam-pressure into this hollow shaft.

The invention is not limited to the use of any special form of rotating cutter.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to

be performed, I declare that what I claim is:—

1. A bone cutting or crushing machine especially adapted for cutting large bones (whale bones), having a pair of jaws, which plate-shaped, downwardly converging jaws are provided with teeth or rows of teeth, characterised in that one of these jaws is adapted to receive an up and down motion and simultaneously an oscillating motion at its lower part, while the other jaw is stationary, both jaws being provided with horizontal rows of teeth, preferably pointing downwardly, so as to cut the bones moved downwardly between said jaws successively in small pieces adapted for further disintegration by a rotary cutter or other crushing device.

2. In a bone cutting or crushing machine as claimed in claim 1, an arrangement such that the bone pieces falling down from the hopper formed by the cutter jaws alight on a tooth row (such as 5), between whose teeth work the teeth of a rotating cutter (such as 4).

3. The bone cutting or crushing machine substantially as described or substantially as shown on the accompanying drawing.

Dated this 19th day of August, 1931.

ANTON GJELSTAD,
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111/112, Hatton Garden, London, E.C.1,
Chartered Patent Agents.

Fig. 1.

[This Drawing is a reproduction of the Original on a reduced scale.]

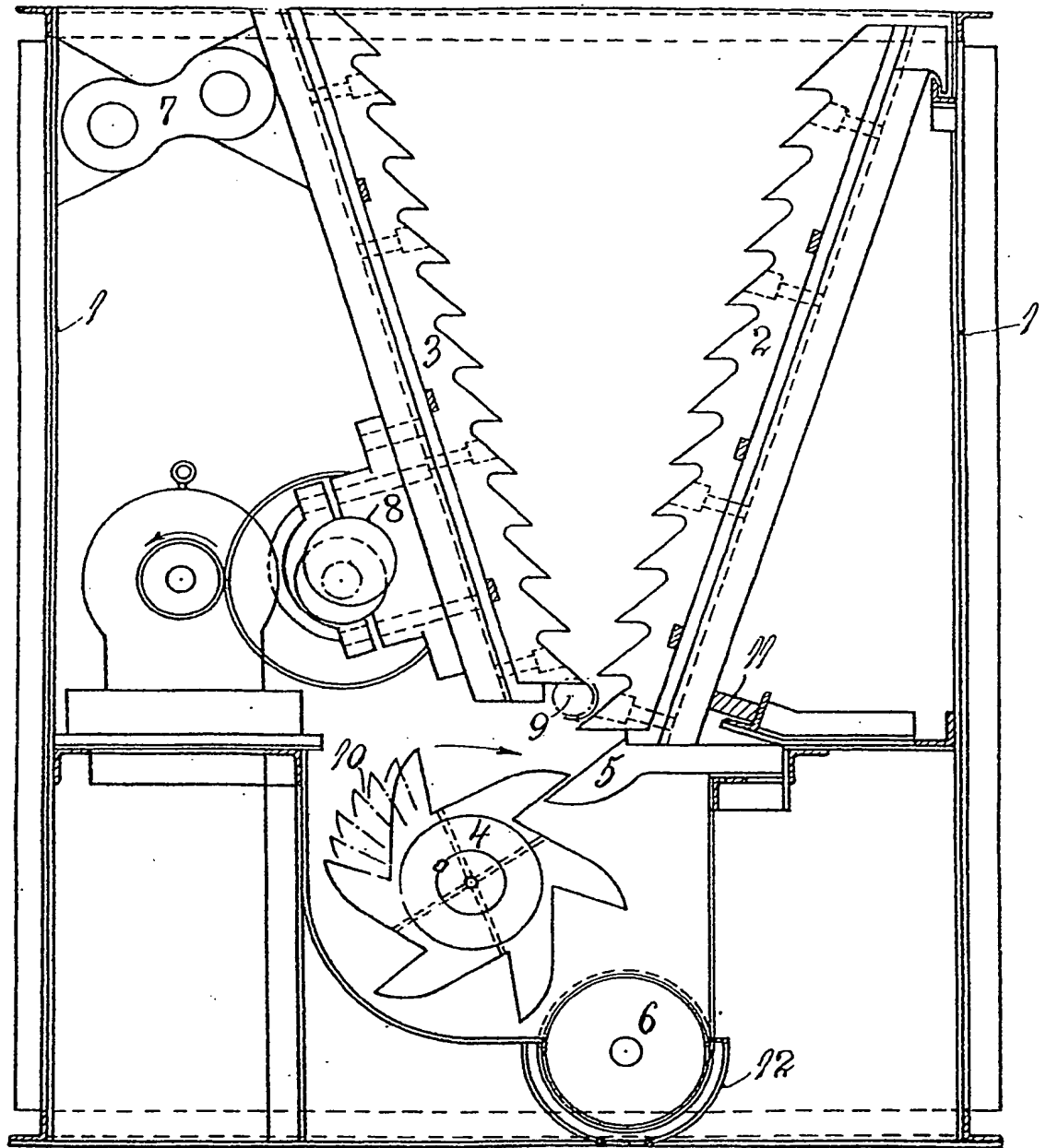


Fig. 2.

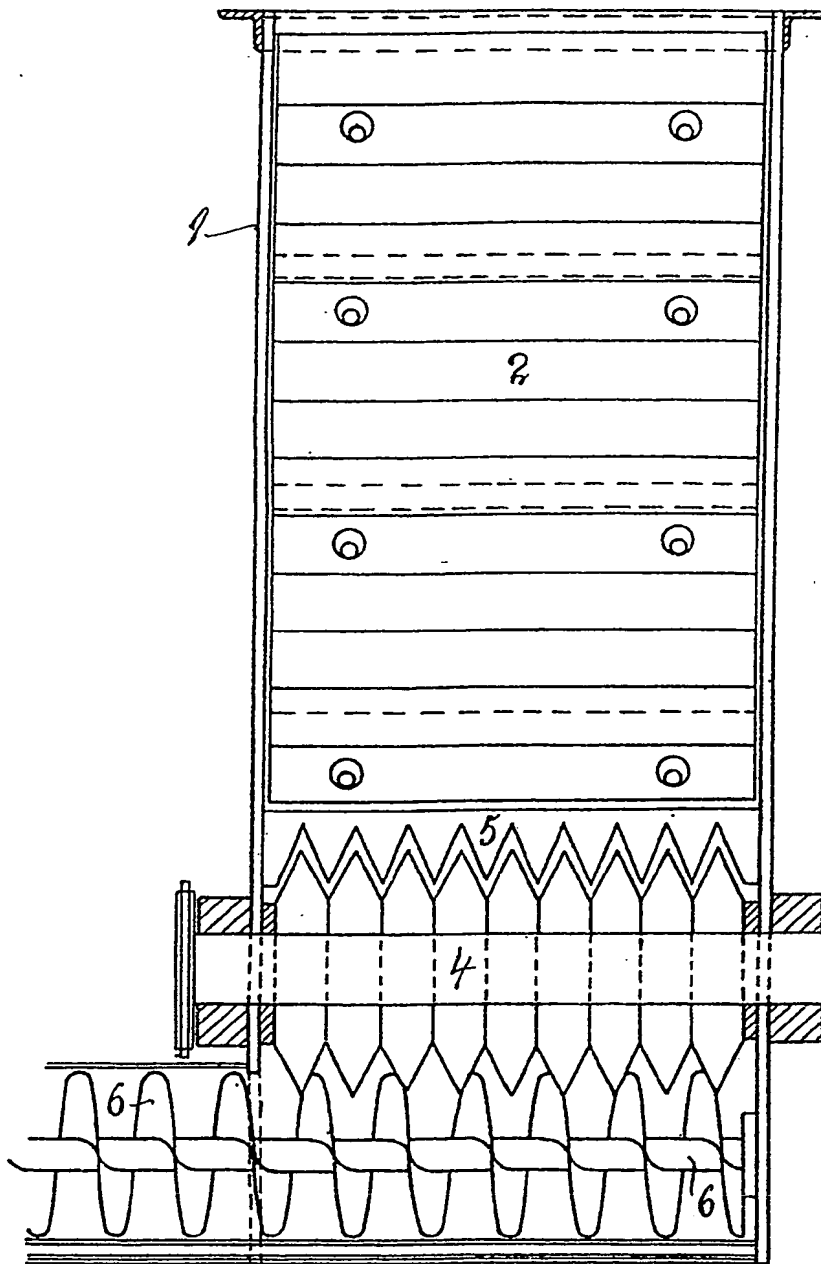
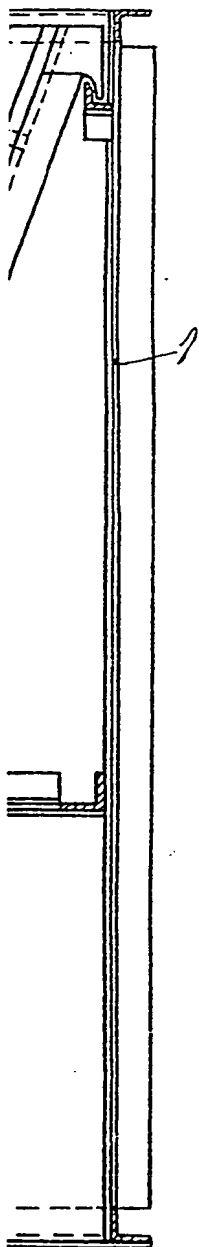
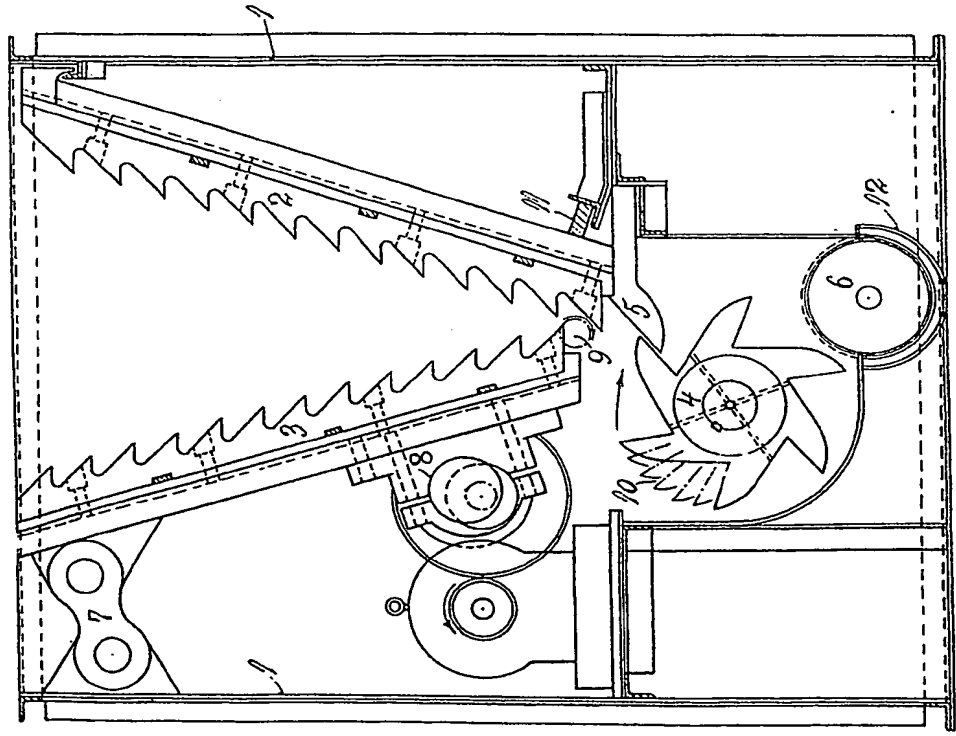
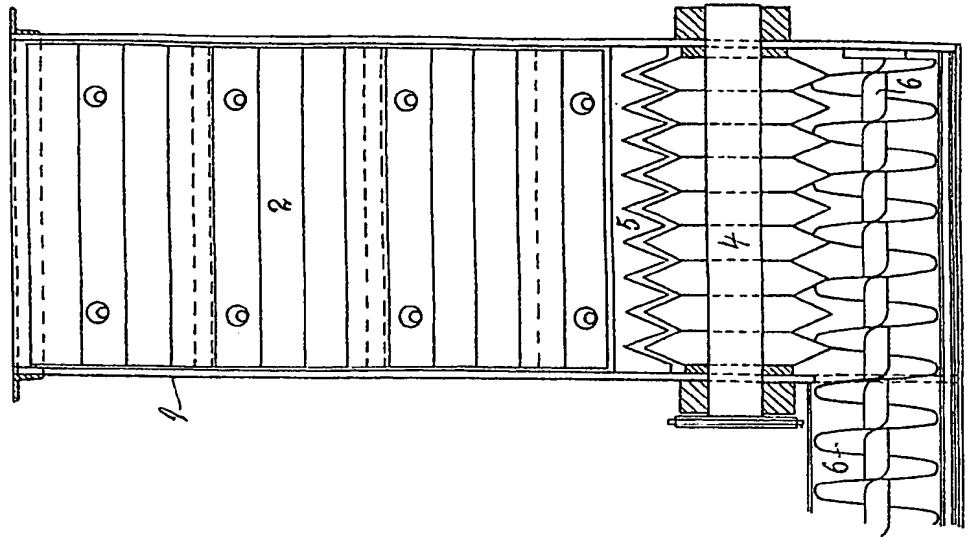


FIG. 1.



[This Drawing is a reproduction of the Original on a reduced scale]

FIG. 2.



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